

Inside...
REVIEWS
Q-Modem (page 2) GCP (page 5) King's Quest II (page 6)
ARTICLES
Secretary Notes & Notes from the Sysop (page 3)
Editor's Notes (page 4)

Deadline for submission to February newsletter on February 10th.

January 1986

TWIN CITIES ATARI INTEREST GROUP

(c) 1985 TAIG. Published by the Twin Cities Atari Interest Group, which is an independant organization with no bus iness affiliation with Atari Corp. Permission is granted to any similar organization, with which TAIG exchanges news letters, to reprint material from this newsletter.

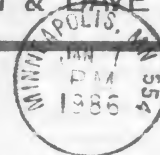
PRESIDENT: DICK JOHNSON (521-0245) VICE PRESIDENT: JIM GLISH
TREASURER: PHYLLIS LANDSMAN SECRETARY: DAVE STENGEL
NEWSLETTER EDITORS: CORY JOHNSON & DAVE STENGEL

Twin Cities Atari Interest Group.
3342 Humboldt Avenue North
Minneapolis, Minnesota 55412

Next TAIG meeting
Sunday, January 12
TAIG 7:00 p.m.
At St. Louis Park Rec Center
5005 West 36th Street
St. Louis Park, Mn.

Next NAGS meeting
Wednesday, January 15
NAGS 6:30 p.m.
At User Friendly Computer
8465 Plaza Blvd.
Spring Lake Park, Mn.

Front Page



Atari 8 bit

We have tripled our inventory of 8 bit software in the last month. This means more in stock selections than before and still at the best prices in town.

Products for the 8 bit line	Retail Prices	Mindtools Prices
Great American Road Race	24.95	19.95
Hacker	24.95	19.95
Bounty Bob Strikes Back	49.95	34.95
Karateka	29.95	23.95
Print Shop	44.95	32.95
P.S. Graphic Lib.	24.95	19.95
Goonies	29.95	23.95
Zorro	29.95	23.95
Eidolon	39.95	29.95
Koronis Rift	39.95	29.95
Spellbreaker	34.95	26.95
Silent Service	34.95	26.95
Lode Runners Rescue	29.95	23.95

Classic Sale

Quantities for items listed as Clearance are all we can get...one of our distributors liquidated all of their inventory, so this may be the last chance we can get any of these again. (these are the good games that were in the inventory. Most of these are cartridges, so they are great for kids.

Clearance for 8 bit line?	QTY	Retail	Clearance
Miner 2049er.....	(4)	\$34.95	\$10.00
Joust (cart).....	(1)	49.95	16.95
Pacman (cart).....	(2)	44.95	10.00
Galaxian (cart).....	(2)	44.95	9.00
Asteroids (cart).....	(2)	34.95	9.00
Centipede (cart).....	(2)	44.95	10.00
Jumbo Jet Pilot (cart).....	(1)	44.95	10.00
Popeye (cart).....	(4)	49.95	9.00
Star Raiders (cart).....	(5)	44.95	10.00
Pooyan (disk&case).....	(2)	29.95	9.00
Repton (disk).....	(2)	39.95	10.00
Jumpman Junior (cart).....	(5)	40.00	10.00
Defender (cart).....	(4)	44.95	10.00
Qix (cart).....	(2)	44.95	10.00
Missile Command (cart).....	(2)	34.95	9.00
Submarine Commander (cart).....	(2)	44.95	12.00
16 Bandits (disk).....	(2)	34.95	10.00
Deluxe Invaders (cart).....	(2)	39.95	9.00
Super Breakout (cart).....	(2)	34.95	8.00
Pitstop (cart).....	(2)	40.00	9.00
Super Cobra (cart).....	(2)	49.95	10.00
Q-Bert (cart).....	(2)	49.95	11.00
Spider City.....	(1)	39.95	8.00

Atari 520ST

Product Name	Mfg. Name	List Price	Mindtools Price
HARDWARE			
520ST (Mono. Ver.)	Atari	\$799.95	\$719.95
520st (RGB Ver.)	Atari	999.95	899.95
12" RGB Monitor	Atari	399.95	359.95
3 1/2" Single Sided Drive	Atari	199.95	179.95
3 1/2" Double Sided Drive	Atari	299.95	269.95
ST Printer Cable	Accu.	24.95	21.95
Hayes Smartmodem 1200	Hayes	599.95	399.95
SOFTWARE			
PC/InterComm (VT100 Emulator)	MarkU	\$124.00	\$99.95
Mince Text Editor	MarkU	175.00	139.95
Spellbreaker	Info	44.95	35.95
Infocom Games	Info.	39.95	32.95
Hitchhikers Guide to Galaxy	Info.	39.95	32.95
Exotic Hippo Almanac	Hippo.	34.95	28.95
HabaHippo C Compiler	Haba	74.95	60.95
Solutions (Business Letters)	Haba	49.95	39.95
Haba Writer	Haba	74.95	60.95
VIP Professional	Shanner	179.95	143.95
Mirage Word Processor	Express	49.95	39.95
A Mind Forever Voyaging	Infocom	44.95	34.95
Kings Quest II	Sierra0	49.95	39.95
Ultima II	Sierra0	59.95	47.95
Mud Pies	Mich	29.95	23.95
Hex	MarkU	39.95	31.95
Rythem (spread sheet/calculator)	N/A	49.95	39.95
ST ToolBox Vol. 1	Mirage	39.95	31.95
Degas Graphics Drawing	BatInc	39.95	31.95
4xFORTH	Dragon	99.95	79.95
Easy-Draw	Migraph	149.95	119.95
Flip Side	Mich	34.95	27.95
Atari ST Companion (Book)	Sunshine	19.95	14.95
Pascal, Personal	OSS	89.95	71.95
Bulk 3 1/2" Disks	Fuji	3.95	1.95
Crimson Crown	Pengs	39.95	31.95
Fahrenheit 451	Spinn	49.95	39.95
Final Word	MarkU	145.95	119.95
Backgammon, Hippo	Hippo	39.95	31.95
Jokes & Quotes, Hippo	Hippo	34.95	27.95
Disk Utilities, Hippo	Hippo	49.95	39.95
Ram Disk, Hippo	Hippo	34.95	27.95
HippoSimple	Hippo	49.95	39.95
HippoSpell	Hippo	39.95	31.95
M-Disk	Mich	39.95	31.95
Regent Spell	Regent	49.95	39.95
Regent Word	Regent	49.95	39.95
ST-Talk	QMI	17.95	14.95
Transylvania	Pengs	39.95	31.95
Treasure Island	Spinn	39.95	31.95
Typing Tutor w/Word Invaders	Acads	34.95	27.95

Mindtool's ST Access Group members get an additional 5% off Software

Article submission

Articles should be submitted in standard text files (Atariwriter, Hometext, Speedscript) or in Letter Perfect format. If you don't own a word processor, you can enter the Article in BASIC using REM statements. Or, send LEGIBLY (including schematics, we can't reprint what we can't read or reproduce) handwritten or typed text to...

Cory Johnson 1835 Shadyview Circle, Plymouth MN. 55447.

Dave Stengel 3230 Shadyview Lane, Plymouth, MN. 55447

articles can also be dropped off at
Wizard's Work 18th and 36th, New Hope MN.

Reprinted from ABLE AID Q-Modem

Let's describe the ideal telecommunications system for your ATARI. Well, it would be nice if one only had to plug a telephone modular plug into the computer, boot the software and transfer text and files utilizing a friendly icon pop-up menu. It's implied that there would be automatic dialing, automated log on, macro commands, standard protocols (XMODEM, DC2/DC4 and A), multi-screen widths and multi baud rates.

The Q-Modem system from Quantum Microsystems Inc. (P.O. Box 179 Liverpool, N.Y. 13088-0179) comes very close to meeting the above specifications.

The basic unit supporting 300 baud is available \$149.95, but there is an optimal 1200 baud up-grade kit, which fits inside the box, for \$79.95. You may select the full capability unit with the kit built-in for \$229.90. The unit measures 4 x 5 x 1.5 inches (it can be built into the side of an Atari 400/800) and has no switches or lights at all. It takes power from the computer via a standard "daisy-chain" serial plug. The only other connection is a modular telephone plug.

The Q-Modem comes with a pre-release version of QuanTerm on disk. The final terminal software will be forwarded when fully operational, after returning the warranty card.

QuanTerm (or Q-Term) is a machine language program that resides on a totally unprotected disk along with an RS-232 handler (Allowing Q-Modem to work with other terminal programs) and a version of the Amis BBS. Extensive documentation is available on disk in the form of help files and is integrated into the system so it is available when needed.

The disk boots into the main Q-Term menu having the following selections: DIAL, ANSWER, EDIT, SET-UP, and HELP. The menu has icons as well as words and is always available. The HELP selection provides 15 text files which can be printed to the printer or to the screen when needed. The documentation teaches the operation of Q-Term, but also covers how to connect Q-Modem, the warranty, and update policy as well as a discussion of the RS-232 handler. While other terminal programs will work with Q-Modem, I can't think of any reason to use anything other than the final version of QuanTerm.

The DIAL function selection takes you to one of the best auto-dialer programs available. You can set up a directory of 16 telephone numbers with names which you can pulse or tone dial. Automatic redial, speed dialing and long distance access are also supported. When a number is selected, Q-Term will configure itself for the BBS dialed, load a set of macros to use with the system, dial and log

on the system automatically.

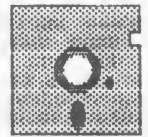
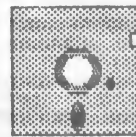
Selecting the ANSWER function from the menu sets Q-Term in a wait and answer on-line mode anticipating a call as well as automatically answering the phone when it rings, thus beginning telecommunications discourse.

The EDIT mode is not implemented in the preliminary version but will allow one to create or modify files while using Q-Term. This is handy for composing messages or viewing down-loaded information as well as printing files to the disk or printer.

The SET-UP selection let's you select the particular options needed for any computer system you want to call. In addition to such common parameters as translation, duplex/echo, parity, baud rate, repeat speed, type ahead window, screen time/dollar clock, cursor blink, answering ring number, CD wait time, column size, screen dump and touch tablet options. Most DOS functions are available from the EDIT and ON-LINE modes.

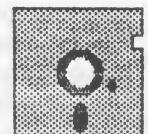
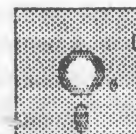
The next version of Q-Term due for October release will have unlimited capture buffer, Compuserve Xmodem and A protocols, extended memory with the 130XE, optional translation modes for the DEC VT 100, IBM and ADM-3 terminals and driver software for 64 and 80 columns.

It is seen that the QuanTerm is a powerful and sophisticated terminal program.



UPGRADE SYNCALC FOR 130XE OWNERS

SEND \$10.00 & DISK
TO
BRODERBUND
17 PAUL DR.
SAN RAFAEL, CA.
94903-2101



Secretary Notes
a column by
David Stengel

Well, of course, as usual we did not have a meeting in December, so how could I write any notes on it? To tell you the truth, there really isn't as much action with Atari as there used to be, and this kind of depresses me. Sure the ST was rather big news, and a lot of things are planned for it (thank goodness), but what about the good ol' eight bit'er? There is hardly any software to be found for it -not produced, but found. Even most of the Target stores, if not all of them, have stopped selling Atari software, as well as hardware. The only time I ever find Atari software in a place like Sears or Target, is when it's on the back of a Commodore disk! This really upsets me. What also upsets me is when places like Dayton's, Saylor's Software First, On-Line Computer Centers, and even the new B.Dalton Software stores do not even go near Atari -except for B.Dalton Software because they sell Antic magazine...but for how long? Of course, one can go into almost any bookstore and find an Antic or Analog magazine. What astounds me is how they (the computer specialist stores) can sell Apple software? No Apple user I know actually PURCHASES software, so where is the market for it? Especially games. B.Dalton Software, and Software First both have shelves and walls full of Apple software, but I wonder how much of that they sell? But then again, if more Atari software was made more easily available to us, would we buy it, or would we scratch our heads and simply say, "Hmm...costs too much."

Notes From the Sysop.
Cory Johnson

Well, the holidays have come and gone, for those of you who received modems as gifts, I welcome you to the wonderful world of telecommunications. A word of warning, watch your long distance calls, they get expensive very quickly (I learned the hard way).

For those who are waiting for the after Christmas sales to buy a modem, my opinions of the best modems are below.

The Atari XM301, this modem sounded too good to be true, and in my opinion it didn't turn out to be the ultimate low-priced modem it was billed as. Although the price is right, it is severely lacking. It has only one I/O port, so, unless you buy a cable with an extra port, this modem will have to be the last item on the daisy chain, bad news, especially if you plan to use the auto-answer feature to run a BBS. It also only has 1 phone in/out jack, meaning if your phone has only one jack in it, as most phones do, the XM 301 has to be plugged into an entirely different phone jack than your voice phone. Also, if you don't own a disk drive, the XM301 is useless. The software that is included with the modem is on disk. Ah, the software, it appears like a joke, but it does allow uploading and downloading. A redeeming feature of the XM301 is the use of the T-handler, as the 1030 modem used, this allows Express 1030, Amodem 7.1 and other 1030 modem programs to run on the XM301.

The Atari 1030, I'm a bit partial towards the 1030, this is the modem I bought before becoming a sysop, and I am still using it on my own system. Again, the price is right, it can be found for about \$10.00 more than the XM301, for this \$10.00, you get an extra I/O port, so it can be located anywhere on the chain, an extra phone jack, so you can plug a phone into the modem, and finally, it includes Modemlink a built in software package. Ok, I admit, Modemlink does have it's limitations, it only supports ASCII, it doesn't support uploading or downloading, and data captures have to be dumped to the printer. But, modem link can be loaded in, directly from the modem, so a disk drive isn't needed. Also, Modemlink can be easily bypassed, allowing the use of more powerful programs, such as Express 1030, and the Amodem programs.

Hayes, and Hayes compatibles. Of course, if you have an B50 interface, and the money (often over \$150), these modems are worth it. On the BBS I am using a Signalman Express 300/1200 bps modem. These modems support BBS programs such as AMIS and Forum without any modifications. If you plan on running a BBS, a Hayes, Signalman, Multimodem, or the DAK modem is definitely worth looking into. Well, those are my opinions about the most common modems floating around now.

We are having some hardware problems with the BBS, so, I can't guarantee that the BBS will be up when you try to call, but it's worth a try.

TAIG/SPACE BBS (612) 473-2897

Reprinted from MACE.

BBS
10 Commandments
Version 1.1

(Submitted by Tim Linehan via the Edmonton RCPM BBS, then captured from the East Area RBBS (IBM), Mt. Clemens MI by the Sysop of MACE EAST. -Ed.)

1. Thou shalt not overstay thy welcome.
2. Thou shalt not use offensive language.
3. Thou shalt not use this BBS to engage in or encourage acts of commercial software piracy.
4. Thou shalt not use this system to advertise products not related to personal computing.
5. Thou shalt not have more than one online ad at a time.
6. Thou shalt not use this system to advertise thy business, except by previous arrangement with the SYSOP.
7. Thou shalt not log on with silly names lest the SYSOP rise up and smite thee.
8. Thou shalt not clutter up the system with trivial messages that are not computer related.
9. If thou art a new user, thou shalt make every effort to find out how a system works through its built in HELP functions before bothering thy beloved SYSOP.
10. Thou shalt contribute software as well as take it.

Ed. Thanks to SPACE, we reprinted this from them, after they reprinted it from everyone else.

by Dave Lyons

(CompuCenter Iowa: JoeApple; CompuServe 72177,3233)

I may never understand how the designers of the RS-232 "standard" for serial communication managed to use 25 wires where only 3 are really necessary. Maybe they made a deal with the companies that make cables, connectors, and switch boxes...I just don't know.

Well, I thought of a few things that the RS-232 standard lacks, and since there are already so many extra signals, a few more can't hurt anybody, right? Heck, let's go for 50-pin connectors and cables and add the following new signals. (Just to make sure this isn't compatible with any old equipment, all OLD signals are moved up one pin number (Carrier Detect becomes 9 instead of 8, etc., and pin 25 goes to pin 1).

Pin	Name	Description
26	XCAT	Should be connected to chassis of devices. Used with the next two signals, this provides protection against cats who haven't learned not to walk on floppy disks or serial equipment. This signal should supply about 2000 volts (at a VERY low current level; wouldn't want to HURT the cute little thing, just teach it not to walk on anything in the computer room).
27	CATGND	Cat ground. Used with pin 26. This signal should be connected to another part of the chassis or the tabletop.
28	CTD	Cat detect.
29	SD	Self-destruct. This signals causes the device to destroy itself.
30	SDACK	Self-destruct acknowledge. Acknowledges that the device has destroyed itself.
31	VADIC	This signal indicates to a computer that the device on the other end is a modem that uses VADIC protocol. (Note: CompuCenter Iowa users should jumper this signal to SD and then buy a decent modem.)
32	STBIT1	Stutter bits. With pin 33, sets the number of "stutter bits" (0 to 3 of them to be included before each byte transmitted. This may reduce the number of people who feel inferior to computer equipment by showing them that computers have problems communicating with each other.
33	STBIT2	
34	CABR	Cable ready. It's not enough to know that the Data Set is ready (DSR) and the Data Terminal is read (DTR). We also need to know that the CABLE connecting them is ready.
35	GRR	Gremlins ready. Not everybody knows it, but there are little green guys inside most modern computer equipment. Most of the time they sleep, but other times they cause trouble. The next 6 signals are for dealing with gremlins.
36	220A	Used with pin 37, supplies 220 volt power for the gremlins' air conditioning. On hot days when gremlins can't sleep, applying power to these pins may solve your problems.
37	220B	
38	110H	110 volts, hot side. When the 220 volt power doesn't help and gremlin problems persist, use this with pin 39 to supply 110 volts for the gremlins' TV and video game center.
39	110N	110 volts, neutral side.
40	MOON	Indicates the phase of the moon. Sometimes solves mysterious problems.
41	LHI	Pins 41 through 45 can be used to implement the "like" protocol when the normal RTS/CTS protocol isn't enough. This one means "Like HI" and is used to establish a connection.
42	LHTY2	Like HI to You Too. Acknowledges pin 41.
43	LLTT	Like Listen To This. Requests permission to send data.
44	LOK	Like OK. Grants permission to transmit data.
45	LWOW	Like WOW. acknowledges receipt of data.
46	HEY	Pins 46 to 50 may be used to implement the "Eighties" protocol when RTS/CTS and "Like" protocols won't do the job. This signal is similar to RTS (Request to Send).
47	NP	No Problem. Acknowledges HEY.
48	HUH?	Signals that data was not received correctly (possibly wrong number of stutter bits).
49	YEAH	Acknowledges data received.
50	KMG365	Like YEAH, but for avid Emergency One fans. That makes 50! Let's hear your suggestions for MORE serial signals. Maybe we can get 100 and REALLY make the cable manufacturers happy.

Editor's Notes

A Collective Effort by
Cory Johnson & Dave Stengel

Ah, January, it seems like only a year ago that Dave and I edited our first newsletter (In fact, it was). It was 3 pages long, on yellow paper, and extremely faint. I think we've come a long way since then. Since then, we've played with fonts, line length, borders, and covers. Now, we've decided upon 2 60 character columns per page. Did you know that we have had NO feedback about what you like or dislike about the newsletter. Please, let us know how we are doing, don't just sit there being apathetic, we really do need your input and participation, not only in the newsletter, but also at the meetings.

I'm sure this will be mentioned in one of Dick's article's, but I think it bears being beaten into a pulp, a Computer Eye's unit was stolen at the November meeting, this is very unfortunate, because it makes each meeting look like an easy target to any thief, and it is bound to cause bad feelings on the part of anyone who is ripped off. In the future, let's all keep our eye's opened, and not let anything like this happen again. Also, if you do set up a table, and have to leave it, have someone watch it, this will eliminate the temptation of an unwatched table.

What would you like to see in the future newsletters? More game reviews, more hardware reviews, Koala pad picture's, the editors run out of town on a rail? Please, let us know what you are thinking, and your opinions for improving the newsletter. Really, we don't mind criticism.

I'd also like to thank Wizard's Work for advertising in almost every issue in the past year, many of these ad's have been full page.

520 ST

THE NEW ATARI!

- 512K RAM
- 8MHZ 68000 CPU
- Centronics, RS232, midi interfaces, GEM desktop & mouse
- 500K 3.5" floppy
- 1.3 Mb/sec hard disk interface
- Much More!

\$799⁹⁵ w/Monochrome
\$999⁹⁵ w/RGB Color Monitor

USER FRIENDLY COMPUTERS +

authorized
SALES-SERVICE
786-8181

8461 Plaza Blvd., Spring Lake Park
-new owners-

Games People Play on Thier Computers Against Other People

A Review by
David Stengel
Cory Johnson

Well, this article is for all you people out there who are board with you modem at present, or looking for something other than boards made from the same copy of Fore.

What do you do when you have four people together, all who own Atari computers and modems, and are all getting sick on Pepsi and Pacante dip. You do what any normal 17 year old newsletter editor, 26 year old naval intelligence personel, another 17 year old editor, and some guy named Bill would do...you go BBSing! But what if you can't decide which board to call? Why not spend six dollars an hour to play games? Well, it just happens we did this, and it was lots of fun.

Games Computers Play (GCP) fits the criteria perfectly. Neil Bradley, a TAIG member who spent most of his time in Denmark this past year or so, called me up one fine day and we decided to get together that same night to chew the fat. Well, Cory was allready over, and my friend Bill (the one who did the Minotaur cartoon in this month's newsletter) called, so we decided to make a party out of it.

It wasn't long until everybody was present. Well talked, played King's Quest, ate, etc. Finally Neil shows us this package with a big GCP on the front of it. Of course, we enquire to it's contents, and he shows us two disks and quite a few refence cards. He (being Neil) went over to the 1030 and turned it on. He then popped a disk into his Rana, booted it up, and after an extended period of time, and one phone number later, we were logged into GCP! We must say that we were impressed, though we did have a few complaints, but then what good critic wouldn't?

Superb graphics, better than CompuServe - also easier to learn. The entire system is joystick driven allowing simple clods (like us) easy access to the functions without all that tedious mucking about through command menus (although you can enter commands via keyboard to save time).

Neil took us through a whole tour of the system (city), but we spent most our time chatting with the sysop and playing Cybership. The sysop was very kind and understanding and answered all our questions. So much for the nice-ities, on to the meat of the article; CYBERSHIP!

All in all we spent about two hours on the system (that's 12 dollars to you and me). During that time we experienced one system crash (if it were perfect, it wouldn't be worth logging onto would it), and lost at least three ships to the other cruel and ruthless users on-line at the time (yes, two or three users!). All the game on the system are real time, and highly addicting. Besides Cybership, there is also Cybertank, Lords Of Space, and Bio War - although we only had the funds to

first. The games allow you to design your own ship, or you can use a preconstructed ship. All except Bio War have to be played against other users because they have no solitaire mode (unless, of course, you like blowing yourself up, unfortunately the system will not allow this).

Complaints: the system does slow down as more users log on, and it seems to us a little rediculous to pay on-line time while accessing graphic screens from your own disk drive, but on the whole it is quite the remarkable system (if you have thirty dollars burning a hole in your pocket).

There is a thirty dollar initial sign up fee, plus fifteen dollars and hour for prime time (business hours) or six dollars an hour after prime hours. It's accessed through a local number, so there are no long distance charges.

For further info contact:

Games Computers Play
112 East Market Street
York, PA. 17401

The perfect space for a VERY small article.
Write an article or a review this month.

Advertising Rates

Eight page	2" x 3.5"	\$5.00
Quarter page	4" x 5"	\$10.00
Half page	5" x 7.5"	\$15.00
Whole page	8" x 10.5"	\$25.00

Contact the editors or the treasurer about placing an ad. The sizes listed take into account the page margins.



**NO... I WANTED A MONITOR,
NOT A MINOTAUR!**

Thanks to Bill Staehle

King's Quest II
a review by
David Stenoel

Well, I must say it feels pretty good to get back into writing about Adventures again. The Adventure business has been rather slow lately, and not just for Atari computers either. You can sort of see why my Adventure column went under. Anyways, this month I have a review of King's Quest II for all you ST owners out there, so enough chat, let's get on with it.

Okay, first of all you may be asking yourself what ever happened to King's Quest I? Well, it doesn't look as though it will be made for the ST's at all. It would have been interesting to play the original before the sequel, but I don't think we'll get such a privilege. As for the reason why, I have no idea (you can see how well informed I am on this). I also wondered why they made Ultima II for the ST, and didn't bother to make Ultima I, but I guess we may never know. Anyways, in King's Quest II you (being Sir Graham) now rule the kingdom of Daventry, and everybody is happy under your rule -everybody except you. Even though you're a good king, you are not a happy king -in fact you are quite a lonely king. You could have any maiden in the kingdom, but you are also a picky king, and unfortunately none of the maidens are good enough for you. Well, of course, your magic mirror has all the answers. There is one maid by the name of Valanise which the jealous witch Hagatha cast into an enchanted land. You see her face in the magic mirror and flip! This is the person you want for your queen, but first you must find her. Thus you start off on your quest in search for the three keys that open the magical door -that leads to the fair Valanise.

Okay that was the purpose, now the play. The game plays quite well, in fact our own Phil Seifert stated that it was better on the ST than the IBM. Personally, I have never tried it on an IBM, but am still really satisfied with it. I think someone finally unleashed the power of the ST (game-wise) when they made this program. Anyways, Sir Graham can move at two speeds (fast or slow) and just about anywhere on the screen. The program makes good use of half of the function keys -it only utilizes F1, F3, F5, F7, F9, and the (=) key. The background graphics as well as the animated graphics are done quite well. The only complaint I have about the game was that some of the puzzles were too simple, and though I have not gotten the full amount of possible points (185), I have gotten to the end of the game. There is more than one way to solve each puzzle, and the more clever solutions earn you more points -well, some of my solutions were not quite clever enough and I earned a score of 178, but hey, it's darn close! Of course, I was so caught up in the game I stayed up rather late trying to solve it. I won't tell you how long it took me to solve it (with partial points) but I will tell you that I still play

the game. There is only one other adventure I solved sooner, and that was The Witness by Infocom. It took me a between twelve to thirteen hours to solve it -I took it back and exchanged it for Deadline. I don't think I will exchange this one, because I think it's a keeper. All in all, I recommend it to anyone -with an ST, IBM, or Apple that is.

Until Sundog...

LESSON SIX: SUBROUTINES & THE STACK

We now take up the first topic in this series that is not absolutely essential to writing programs: subroutines.

The loops and indexed addressing discussed in the previous lecture are truly essential: it is hardly possible to write a useful program that has no loops. Subroutines are a matter of convenience, not necessity.

It is quite possible to write an entirely adequate program without using a single subroutine. However, you will find that the convenience of subroutines with large programs is so great that you would never want to write such a program without them.

The primary purpose of a subroutine is to perform some function that is frequently needed at many points in the program. Instead of having to repetitively insert the same code over and over again, we simply write it once, place it in a subroutine, and call that subroutine many times from the main program. The use of subroutines dramatically reduces the size of a program.

Subroutines are implemented on the 6502 in a fashion very similar to that used by BASIC. You may recall the two BASIC commands for subroutines: "GOSUB lineno" and "RETURN". The two corresponding 6502 commands are "JSR label" and "RTS". The label in "JSR label" is the label of the beginning of the subroutines.

Thus, writing and using subroutines in 6502 is trivially simple. First, you write the subroutine. You give it a name (say, "MYSUBR") and stick that label in front of the first instruction. You put an RTS command after the last normal command of the subroutine. To call the subroutine, you just put JSR MYSUBR. That's all it takes!

However, in order to understand how it works is not so easy. Here's the problem we must solve when the 6502 jumps to a subroutine, the JSR instruction tells it the destination address to which the 6502 must jump. But when the 6502 hits the RTS instruction, how does it know the address to which it must return?

The RTS doesn't say, "Return to THIS address"; it says only "Return". Moreover, how could the 6502 know where to return? If the subroutine can be called from, say, five different points in the program, how would the 6502 know which of those points to which it must return?

What if we gave the 6502 a special register for remembering return addresses? That is, whenever the 6502 encounters a JSR instruction, it stores the current address into its return address register. Then when it encounters an RTS instruction, it simply takes the address out of the return address register.

There is only one problem with this: what if we use

nested subroutines (one subroutine calls another)? The second subroutine call will erase the return address for the first subroutine call. Trouble!

The solution to all this is called a stack. A stack is a chunk of RAM allocated for certain special operations such as subroutines. The 6502 stack is stored on page one -- that is, addresses \$0100 to \$01FF. The stack operates like 128 return address registers arranged in sequence (remember: two bytes per address). The 6502 keeps a stack pointer register to keep track of which byte in the stack is currently being used.

I will now trace through the operation of the stack in a subroutine. We start with the stack pointer set equal to \$FF. That means that the stack is empty; the stack pointer is at the very top of the stack. The 6502 encounters a JSR instruction. It takes the current value of the program counter and breaks it into two bytes. It pushes the first byte onto the stack. This means that it stores the first byte at \$01FF, then decrements the stack pointer. Now the stack pointer is \$FE.

Then the 6502 then pushes the second byte of the return address onto the stack, storing that byte at \$01FE and decrementing the stack pointer to \$FD. Then the 6502 jumps to the subroutine. When it encounters the RTS instruction, it pulls the two address bytes off of the stack (increments stack pointers and loads byte at address \$0100, SP). Those two bytes go directly into the program counter, returning the 6502 to the original entry point.

The advantage of this approach is that it allows very deep nesting of subroutines. If one subroutine calls another, the 6502 simply stores more values onto the stack. The addresses won't be confused because you always exit subroutines in exactly the reverse of the order that you entered them.

You can use the stack yourself, if you wish. You have six instructions that allow you to play with the stack: PHA, PLA, PHP, PLP, TSX, and TXS.

The PHA instruction pushes the value of the accumulator onto the stack and decrements the stack pointer. The PLA instruction increments the stack pointer and pulls the current stack value into the accumulator. These two instructions allow you to store and retrieve values onto the stack. They must be exactly balanced, though, or you will generate that most feared of bugs, the stack crashes.

Consider: you are in a subroutine. You push a value onto the stack, but forget to pull it off. When the 6502 attempts to return to its original location, it pulls two address bytes off the stack -- but they're the wrong two bytes. One of them is the value you pushed but didn't pull. Result: the 6502 return to the wrong address. Your program goes haywire and the computer crashes.

This is called a stack crash. This type of crash tends to be particularly difficult to recover from. Prevention is the best medicine here. The rule for preventing stack

crashes is simple and absolute: each and every push onto the stack must be balanced by one pull from the stack. Violate this rule and you will certainly experience a stack crash.

The next pair of stack manipulation instructions are PHP and PLP. These push and pull the process status register pmtp the stack. They are useful for two purposes.

First, you may wish to save the values of the various flags before performing some operation, then restore them so that you can branch on a previously created condition. Second, it is sometimes handy to PHP, than PLA to get the processor status register into the accumulator where you can more directly manipulate it. Again, each push must be balanced by one pull.

The third stack manipulation pair of commands do not modify the stack. They are TSX and TXS. These transfer the stack pointer to and from the x-register. Once in the x-register, you can change the value of the stack value and then TXS to jump over sections of the stack. This can be a very handy way to pass parameters to subroutines, but it is also very tricky. If you make a mistake, you will generate a stack crash. So be careful with this one. I have always avoided these commands like the plague. They are very dangerous and never essential.

Notes from the Pres:

Well here it is Jan again and the CES show is soon to begin. Last year at this time the 520ST was still a prototype and rumors abounded. Well we now have seen some these rumors come true and others fall by the wayside. Serious business software for the ST still command a premium price (Final Word \$145, VIP \$179) but still cheap when you compare it to IBM prices.

But other titles like DEGAS (at \$39) and ST-Talk (at \$20) are more reasonably priced. Although many of the titles are familiar many are starting to show up which have not been available to the old 8 bit line, such as Kings Quest II, and others have been improved to take advantage of the mouse and dropdown menus (like Ultima II).

What about the AMIGA? Its following much the same path that the ST had to tread. Titles are just now appearing and most of them are of the text adventure type (infocom titles) much to little to late for a Christmas impact.

Rumors? Well one of the most important to Atari at least is that Atari has signed an agreement with AT&T to provide ST's as low-end Unix terminals. If true it would assure the life of Atari Corp for some time to come. Borland has bought several developers packages, so it would appear that they thing the ST will be around for a while. Rising Star has also jumped on the ST band wagon with a Midi record playback recorder program and assorted utilities.

Are you tired of incomplete, inaccurate and insulting reviews of the ST. Well the Jan BYTE has one which starts out "The following is a BYTE product description. It is not a review" and I thought, here we go again. But for once we are presented with a description which is not only accurate but informative as well. They promise a review in the future, I can hardly wait. This "description" consisted of "12" full pages covering topics and providing information which I have never heard before. What can I say, my hats off to Jon R. Edwards, Phillip Robinson & Brenda McLaghlín of BYE. Be sure to read this article especially those of you who are interested in the technical side of the ST.

The User Friendly ST Group has changed thier name to STING (I liked STAG myself) ST INTERest Group. They meet Jan 8th this month at 7PM.

Well thats it for now. See you at the meeting (Jan 12) Dick Johnson.

**Wizard's
Work** 
ATARI

your home computer center

Post Haste Square, County Rd. 18 & 36th Ave. No.,
New Hope (North Side of Bldg.)

545-2136

—Repair Service Offered—

New . . . Atari Computers

IN STOCK

ATARI 520ST COMPUTER

ST SOFTWARE

ATARI 130XE COMPUTER

1050 DISK DRIVE

1027 PRINTERS

NEW ATARI SOFTWARE

ASK ABOUT

PACKAGE DEALS

DISCOUNTS

AND SPECIALS

FOR CLUB MEMBERS

